Remarks

Claims 1-7 have been canceled, claims 8 and 9 have been amended, and new claim 10 replacing claim 7 has been added in response to the rejections herein under 35 U.S.C. §102, 35 U.S.C. §103, and 35 U.S.C. §112. These amendments are believed to place this application in condition for allowance, but in the event the application is not allowed, entry of those amendments for purposes of appeal is respectfully requested for the reason that they will substantially reduce the issues to be considered in the event of such an appeal.

Summarizing the above amendments, all of Applicants' claims to a reactor have been cancelled, and the remaining claims to a method have been rewritten to more particularly point out the subject matter which the Applicants regard as their invention. Claim 10 is essentially a rewritten version of canceled claim 7 wherein the scope of the method has been narrowed to the treatment of a gas-liquid feed stream, thereby correcting the omission noted by the Examiner at page 9 of the Final Rejection. In addition, the method has been limited to feed streams comprising gas and liquid in proportions effective to develop Taylor flow, as recited from page 8, line 24 to page 9, line 7 of the specification. Basis for the amendment to claim 9, in response to the rejection under 35 U.S.C. §112, is found at page 8, lines 9-17 of the specification.

Addressing only the rejections of the remaining method claims (now claims 8-10), the Examiner has held those claims to be anticipated by any of Ruff et al. (Ruff), Hervert et al. (Hervert), or Stach et al. (DE 4243424 - Stach). Ruff and Hervert, cited in support of the initial rejection of claims 7-9 of this application (see paragraphs 5 and 6 of the first Office Action), teach honeycomb catalyst stacks wherein the channels are offset to divide the process streams. However, neither reference teaches the processing of mixed gas-liquid feed streams, or gas-liquid feed streams featuring Taylor flow, or the advantages of "closed" channel discontinuities for treating such feed streams. As the Applicants disclose at page 8, line 24 to page 9, line 7 of the specification:

> The flow regime commonly referred to as Taylor flow has been understood to provide the highest mass transfer coefficients. This is a flow regime wherein the gas and liquid proceed through the channels of the honeycomb in an organized procession of liquid slugs separated by gas

> bubbles, the bubbles being of the same order of magnitude in size as the liquid slugs and as the diameter of the honeycomb channels.
>
> This understanding would suggest that the highest mass transfer efficiency, and thus the highest product yields, require the avoidance of disruptions in Taylor flow. To the contrary, the results of catalyst testing carried out by us using equivalent volumes of honeycomb catalyst arranged different ways within a reactor enclosure demonstrate that some disruptions are helpful, and thus that other honeycomb arrangements can be more efficient.

Thus it is clear that neither Ruff nor Hervert anticipate the Applicants' amended claims 8-10 to a process for treating a gas-liquid feed stream under Taylor flow conditions.

Unlike Ruff and Hervert, newly cited DE 4243424 (Stach) does disclose the processing of a gas-liquid feed stream through a honeycomb catalyst stack. However, again, there is no teaching or suggestion to process that gas-liquid feed stream under conditions wherein the proportions of gas and liquid are such as to initiate Taylor flow in the honeycomb channels. Further, there is no teaching regarding the advantages of processing such a feed stream through a stack comprising only "closed" channel discontinuities, required by the Applicants to avoid unchanneled or unguided feed stream flow:

> The invention is based in part on the discovery that arranging the honeycomb catalyst packing to provide "closed" channel discontinuities in the honeycomb channels traversing the reactor increases the apparent activity of the catalyst. Closed channel discontinuities are discontinuities substantially free of unchanneled or unguided flow, such as the unguided flow that occurs in open chambers or spaces within conventional catalytic reactors for promoting random feed stream mixing. (page 3, lines 8-16 of the specification)

and further:

> The result of this flow pattern is significantly higher apparent catalytic activity than provided by equivalent volumes of catalyst with no channel discontinuities, or with conventional mixing sections, without significant added cost for the added catalytic activity. A further advantage of the approach is that the costs of added measures to insure channel alignment are entirely avoided. In fact, honeycomb orientations within the bed may be nearly random, since the effectiveness of the invention does not depend on the exact degree of channel misalignment between the upstream and downstream honeycombs. (page 3 line 27 to page 4, line 5 of the specification).

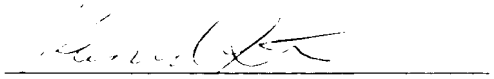
The Applicants respectfully submit that neither Taylor flow processes nor processes requiring the use of catalyst beds that avoid unchanneled or unguided flow are effectively suggested by Stach et al. For example, at least Figs. 1, 5 and 6 of Stach et al. illustrate honeycomb constructions wherein significant open mixing zones are present between catalyst layers.

Further, the advantages discovered by the Applicants attending the use of closed channel discontinuities for gas-liquid feed stream processing were entirely unexpected. Current understanding regarding such reactions is that the highest mass transfer efficiency, and thus the highest product yields, are achieved by maintaining Taylor flow (slug flow comprising a succession of liquid slugs and gas bubbles through the honeycomb channels that are approximately the same order of magnitude in size). As noted above, the Applicants surprisingly found that arranging honeycomb catalyst sections to provide "closed" channel discontinuities in the honeycomb channels traversing the reactor increases the apparent activity of the catalyst. Moreover, that higher apparent catalytic activity is realized without significant added cost for the catalyst.

For all of the above reasons the Applicants respectfully submit that method claims 8-10 of this application as amended are neither anticipated nor suggested by any of Ruff, Hervert, or Stach, and are therefore in condition for allowance. Accordingly, favorable reconsideration of this application and allowance of those remaining claims are courteously solicited.

Applicants believe that no extension of time is necessary to make this Reply timely, but respectfully request the grant of any extension necessary for that purpose under 37 C.F.R. § 1.136(a), and hereby authorize the Patent and Trademark Office to charge any necessary fee or surcharge for any such extension to Deposit Account 03-3325 of Corning Incorporated.

Respectfully submitted,



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